# PLANT AND CELL PHYSIOLOGY

#### EDITORIAL BOARD

Takashi AKAZAWA Faculty of Agriculture Nagoya University, Nagoya

Eiji HASE Institute of Applied Microbiology University of Tokyo, Tokyo

Hirosi HUZISIGE Faculty of Science Okayama University, Okayama

Yoshio MASUDA\*
Faculty of Science
Osaka City University, Osaka

Atsushi TAKIMOTO Faculty of Agriculture Kyoto University, Kyoto

Naohiko YANAGISHIMA Faculty of Science Osaka City University, Osaka Masaki FURUYA
Faculty of Science
University of Tokyo, Tokyo

Akihiko HATTORI Institute of Ocean Research University of Tokyo, Tokyo

Noburo KAMIYA
Faculty of Science
Osaka University, Osaka

Yukito OOTA Faculty of Science Nagoya University, Nagoya

Ikuzo URITANI Faculty of Agriculture Nagoya University, Nagoya

(\* : Editor-in-chief)

Volume 13

1972

Japanese Society of Plant Physiologists Kyoto, Japan The publication of this journal has been supported in part by financial aid from the Ministry of Education.

### CONTENTS

#### No. 1, February, 1972

Bennici, A., M. Buiatti, F. Tognoni, D. Rosellini and L. Giorgi:	
Habituation in Nicotiana bigelovii tissue cultures: Different be-	
haviour of two varieties	1
Huck, M. G.: Impairment of sucrose utilization for cell wall forma-	
tion in the roots of aluminum-damaged cotton seedlings	7
Mizrahi, Y., A. Blumenfeld and A. E. Richmond: The role of abscisic	
acid and salination in the adaptive response of plants to reduced	
	15
Satoh, K.: Effects of urea and σ-phenanthroline on F-695 emission	-
	23
Takamiya, K. and M. Nishimura: Characteristics of photooxidation	0.7
1	35
Kobayashi, K. and T. Yamaki: Studies on soluble RNA binding	10
	49
Yamaki, S. and I. Uritani: The mechanism of chilling injury in sweet	
potato VI. Changes of lipid components in the mitochondrial membrane during chilling storage	67
Mohanty, P., B. Z. Braun, Govindjee and J. P. Thornber: Chlorophyll	31
fluorescence characteristics of system I chlorophyll a-protein	
complex and system II particles at room and liquid nitrogen	
	81
Tsuji, T. and Y. Fujita: Electron donor-specificity observed in photo-	
system I reactions of membrane fragments of the blue-green alga	
	93
Nakano, M. and T. Asahi: Subcellular distribution of hydrolase in	
germinating pea cotyledons	01
Muto, S. and I. Uritani: Glucose 6-phosphate dehydrogenase from	
sweet potato: Effect of various ions and their ionic strength on	
enzyme activity1	11
Barash, I. and H. Mor: Studies on the control and properties of	
ornithine transcarbamylase in germinated spores of Geotrichum	
candidum	19
Ishiguri, Y. and Y. Oda: The relationship between red and far-red	0.1
light on flowering of the long-day plant, Lemna gibba	31
Norton, J. S. and R. W. Krauss: The inhibition of cell division in	20
Saccharomyces cerevisiae (Meyen) by carbon dioxide	39
Penel, Cl. et H. Greppin: Evolution de l'activité auxines-oxydasique	
et peroxydasique lors de l'induction photopériodique et de la	
sexualisation de l'épinard (Evolution of the auxin-oxidase and	
peroxidase activity during the spinach's photoperiodic induction	51
and sexualisation)15	)1

<ul> <li>Berry, D. L., B. Singh and D. K. Salunkhe: Incorporation of β-hydroxy-β-methylglutaric acid into carotenoids and other ether soluble compounds in maize seedlings</li></ul>
Short communications
Paneque, A., J. Ma Vega, J. Cardenas, J. Herrera, P. J. Aparicio and M. Losada: 185W-labelled nitrate reductase from Chlorella
No. 2, April, 1972
Osafune, T., S. Mihara, E. Hase and I. Ohkuro: Electron microscope  studies on the vegetative cellular life cycle of Chlamydomonas reinhardi Dangeard in synchronous culture I. Some characteristics of changes in subcellular structures during the cell cycle, especially in forma- tion of giant mitochondria
and amides in barley plants during ammonia and nitrate assimila-
tion

Kimimura, M. and S. Katoh: On the functional site of manganese
in photosynthetic electron transport system287
Pilet, PE., R. Prat and JC. Roland: Morphology, RNase and
transaminase of root protoplasts297
Kojima, M. and I. Uritani: Studies on chlorogenic acid biosynthesis
in sweet potato root tissue using trans-cinnamic acid-2-14C and
quinic acid-G-3H311
Greene, D. W. and M. J. Bukovac: Penetration of naphthaleneacetic
acid into pear (Pyrus communis L.) leaves321
Floris, C., G. Giovannozzi-Sermanni and P. Meletti: Seed germina-
tion and growth in Triticum I. Biological activity of extracts
from T. durum endosperms
Yoshida, R. and T. Oritani: Cytokinin glucoside in roots of the rice
plant
Brown, G. N.: Changes in ribosomal patterns and a related mem-
brane fraction during induction of cold hardiness in mimosa
epicotyl tissues
Yamashita, T., J. Tsuji-Kaneko, Y. Yamada and G. Tomita: Man-
ganese content, fluorescence yields and the effect of chloride ion
on Hill reaction activity of Tris-washed and reactivated chloroplasts353
Konishi, S., M. Ozasa and E. Takahashi: Metabolic conversion of
N-methyl carbon of 7-glutamylmethylamide to caffeine in tea plants365
The state of the s
Short communications
Muto, S. and I. Uritani: Inhibition of sweet potato glucose 6-phosphate
dehydrogenase by NADPH2 and ATP
Krishnamoorthy, H. N.: Effect of GA <sub>3</sub> , GA <sub>4+7</sub> , GA <sub>5</sub> and GA <sub>9</sub> on
the sex expression of Luffa acutangula var. H-2381
Inoue, Y., T. Ogawa and K. Shibata: A far-red absorbing form
of chlorophyll formed by the action of aminotriazole385
Shinozaki, M.: Floral initiation of Pharbitis nil, a short-day plant,
under continuous high-intensity light391
No. 3, June, 1972
Koiwai, A. and M. Noguchi: Metabolism of glutamate and 7-
aminobutyrate in cultured tobacco cells
Suge, H.: Mesocotyl elongation in japonica rice: Effect of high
temperature pre-treatment and ethylene401
Mae, T., K. Ohira and A. Fujiwara: Metabolism of S-methylcysteine
and pectin esterification in Chinese cabbage, Brassica Pekinensis
Rupr
Matsuzaki, E. and Y. Kamimura: Purification and properties of
soluble cytochrome b-560 from spinach leaves
Suzuki, R. and Y. Fujita: Studies on the Hill reaction of membrane
fragments of blue-green algae II. The reaction steps inactivated
at high water concentration427

Pjon, C. J., R. Suzuki and Y. Fujita: Photochemical activity, fluorescence and absorption spectrum of the photochemically active chromoprotein (ACP) isolated from the blue-green alga <i>Anabaena</i>	
cylindrica	437
Jadhav, S., B. Singh and D. K. Salunkhe: Metabolism of unsaturated fatty acids in tomato fruit: Linoleic and linolenic acid as pre-	4.40
cursors of hexanal	449
Shibaoka, H.: Gibberellin-colchicine interaction in elongation of azuki bean epicotyl sections	461
Crozier, A., R. C. Durley, R. P. Pharis, D. H. Bowen and J. MacMillan: Inactivity of some acetone condensation products and candicandiols A and B in gibberellin bioassays	471
Huzisige, H. and Y. Yamamoto: Analysis of photosystem II using	
particle II preparation I. Experimental evidence supporting the idea of the involvement of two light reactions in photosystem	
II of green plant photosynthesis	477
	493
Lüttge, U., C. B. Osmond, E. Ball, E. Brinckmann and G. Kinze: Bisulfite compounds as metabolic inhibitors: nonspecific on	505
membranes	505
acids, protein and ribonuclease activity during maturation of peanut seeds	515
Kawashima, N. and T. Ayabe: Effects of temperature and various metal ions on the solubility of tobacco RuDP carboxylase	523
Konishi, K., N. Yaginuma and K. Shibata: Carotenoids and fatty alcohols as non-ionic hydrophobic inhibitors of photochemical	
activities chloroplasts	531
Sugahara, K. and T. Oku: Oligomycin-insensitive incorporation of <sup>32</sup> P into chloroplast protein by illumination	549
Rottenburg, W.: Gefriervorgänge in lebendem Pflanzengewebe: Der Beginn des intrazellulären Gefrierens	563
Short communications	
Oota, Y.: The response of Lemna gibba G3 to a single long day in the presence of EDTA	575
Kisaki, T., N. Yano and S. Hirabayashi: Photorespiration: Stimulation of glycine decarboxylation by oxygen in tobacco leaf disks	
1 1 0	581
Tsuboi, M., S. Kamisaka and N. Yanagishima: Effect of cyclic 3', 5'-adenosine monophosphate on the sporulation of Saccharomyces	71.001
cerevisiae	585

#### No. 4, August, 1972

Ohmori, M. and A. Hattori: Effect of nitrate on nitrogen-fixation by the blue-green alga <i>Anabaena cylindrica</i>	589
Sasaki, K., K. Takaya and T. Ueno: Suppression of nucleic acid	309
synthesis in chromatin of Spirogyra during conjugation process	601
Noodén, L. D.: Inhibition of nucleic acid synthesis by maleic hydrazide	609
Esashi, Y., T. Shibasaki and K. Saito: Flowering responses of Lemna	
perpusilla and L. gibba in relation to nitrate concentration in	COS
the culture medium	623
function in chloroplasts of greening mutants of Scenedesmus I.	
Formation of chlorophyll	633
Konishi, K., T. Ogawa, Y. Inoue and K. Shibata: Effects of cationic	
and anionic chain compounds on absorption spectra and photo-	
chemical activities of chloroplasts	651
Ellis, R. J.: Control of palmelloid formation in the green alga <i>Pediastrum</i> Minamikawa, T. and S. Yoshida: Alicyclic acid metabolism in	1663
plants 4. Effect of external supplies of shikimate and quinate	
to excised hypocotyls of <i>Phaseolus mungo</i> seedlings	673
Palmer, C. E. and W. G. Barker: Changes in enzyme activity during	
elongation and tuberization of stolons of Solanum tuberosum L.	
cultured in vitro	681
Hsu, J. C. and B. N. Smith: 13C/12C Ratios of carbon dioxide from	
peanut and sunflower seedlings and tobacco leaves in light and in darkness	689
Konishi, S., T. Inoue and E. Takahashi: Localization of the carbon	005
in caffeine biosynthesized from $N$ -methyl carbon of $\tau$ -glutamyl-	
amethylamide in tea plants	695
Bowen, J. E.: Effect of environmental factors on water utilization	
and boron accumulation and translocation in sugarcane	703
Curtis, R. W. and G. Fellenberg: Effect of malformin on adventitious root formation and metabolism of indoleacetic acid-2-14C by	
Phaseolus vulgaris	715
Morgan, P. W. and J. L. Fowler: Ethylene: Modification of	
peroxidase activity and isozyme complement in cotton (Gossypium	
hirsutum L.)	727
Short communications	
Sasaki, K. and K. Takaya: Suppression of nucleic acid synthesis	
in mitochondrial and chloroplast fractions of Spirogyra during	
conjugation process	737
Eilati, S. K., P. Budowski and S. P. Monselise: Xanthophyll esterifi-	
cation in the flavedo of citrus fruit	741

## No. 5, October, 1972

Ochiai-Yanagi, S. and E. Hase: Studies on chlorophyll formation in <i>Chlorella protothecoides</i> II. Enhancing effects of light and suppressive effects of glucose on the development of porphyrin-	
synthesizing activity during light-induced greening of etiolated algal cells	747
Okagami, N.: The nature of gibberellin-induced dormancy in aerial	
tubers of Begonia evansiana	763
Oku, T., M. Yoshida and G. Tomita: The photoconversion of heat- treated <i>Chenopodium</i> chlorophyll protein and its pH dependence	773
Goldstein, L. D., P. H. Jennings and H. V. Marsh, Jr.: L-Phenyl-	//0
alanine ammonia-lyase activity in asparagus spears: Effects of excision and incubation	783
Yamaki, S. and I. Uritani: Mechanism of chilling injury in sweet	
potato VII. Changes in mitochondrial structure during chilling storage	795
Satoh, K. and S. Katoh: Studies on cytochromes in photosynthetic	
electron transport system I. Photoreduction and photooxida-	007
tion of cytochrome $b_{559}$ by photosystem II in spinach chloroplasts Komamine, A., T. Shimizu, H. Ashihara and M. Shimokoriyama:	807
The mechanism of changes in respiratory activity during callus	
formation in carrot root slices cultured in vitro	821
Chen, J. and B. J. D. Meeuse: Induction of indole synthesis in the appendix of Sauromatum guttatum Schott	831
Syōno, K. and T. Furuya: Effects of cytokinins on the auxin re-	
quirement and auxin content of tobacco calluses	843
Sakurai, H.: Studies on photophosphorylation II. Uncoupling of chloroplasts by anions at low temperatures and at acidic pH	
values	857
Gilbert, M. L. and A. G. Galsky: The action of cyclic-AMP on GA <sub>3</sub>	
controlled responses III. Characteristics of barley endosperm acid phosphatase induction by gibberellic acid and cyclic 3', 5'-	
andeosine monophosphate	867
Chen, J. C. W.: Effects of continuous illumination on the rhizoid cluster of Caulerpa prolifera	075
Satoh, K., S. Kateh and A. Takamiya: Light and dark rate-deter-	8/3
mining steps in electron transport reactions in spinach chloro-	
plasts  LeClaire, J. A. and B. R. Grant: Nitrate reductase from Dunaliella	885
tertiolecta, purification ane properties	899
Short communications	
Alpi, Λ. and A. A. De Hertogh: Effect of preincubation UV irradiation of abscisic acid and gibberellin A <sub>3</sub> on α-amylase induction in barley half-seeds	909

Yamamoto, Y.: The fatty acid composition of akinetes, heterocysts
and vegetative cells in <i>Anabaena cylindrica</i>
IBA on rooting and on the sprouting of buds on stem cuttings
of Ipomoea fistulosa
Kitahara, Y., H. Yanagawa, T. Kato and N. Takahashi: Asparagusic
acid, a new plant growth inhibitor in etiolated young asparagus
shoots923
Mayevsky, A. and U. Marchaim: Studies on the effect of lucerne saponins on the respiration of cotton seeds using <sup>18</sup> O <sub>2</sub> 927
Muto, S. and I. Uritani: Behaviors on gel-filtration and electro- phoresis of 6-phosphogluconate dehydrogenase isozymes isolated from sweet potato
N- 6 D
No. 6, December, 1972
Bishop, N. I. and H. Senger: The development of structure and function in chloroplasts of greening mutants of <i>Scenedesmus</i> . II.  Development of the photosynthetic apparatus
lase level during the processes of degeneration and regeneration
of chloroplasts in <i>Chlorella protothecoides</i>
synthesis by RNA polymerase in vitro965
Ogura, N.: Studies on chlorophyllase in tea leaves III. Properties
of soluble and insoluble chlorophyllases971
Osafune, T., S. Mihara, E. Hase and I. Ohkuro; Electron microscope
studies on the vegetative cellular life cycle of Chlanydomonas reinhardi
Dangeard in synchronous culture II. Association of mitochondria
and the chloroplast at an early developmental stage981
Saijyo, R. and T. Takeo: The importance of linoleic acid and linolenic
acid as precursors of hexanal and trans-2-hexenal in black tea991
Akagawa, H., T. Ikawa and K. Nisizawa: The enzyme system for the
entrance of <sup>14</sup> CO <sub>2</sub> in the dark CO <sub>2</sub> -fixation of brown algae
Ikawa, T., T. Watanabe and K. Nisizawa: Enzymes involved in the last steps of the biosynthesis of mannitol in brown algae
Suge, H.: Inhibition of photoperiodic floral induction in <i>Pharbitis</i> nil by ethylene
Sherald, J. L. and H. D. Sisler: Selective inhibition of antimycin A-insensitive respiration in <i>Ustilago maydis</i> and <i>Ceratocystis ulmi</i>
Ishizaka, N. and K. Tomiyama: Effect of wounding or infection by <i>Phytophthora infestans</i> on the contents of terpenoids in potato tubers
Ohashi, H. and I. Uritani: The mechanism of chilling injury in sweet potato IX. The relation of chilling to changes in mitochondrial respiratory activities
*

Kojima, M. and I. Uritani: Elucidation of the structure of a possible intermediate in chlorogenic acid biosynthesis in sweet potato root tissue	1075
Matsuno, H. and I. Uritani: Physiological behavior of peroxidase	1085
Wilson, R. H., J. Dever, W. Harper and R. Fry: The effects of valino-	1091
mycin on respiration and volume changes in plant mitochondria Sawhney, S., N. Sawhney and K. K. Nanda: Partial substitution	1103
by long days of short days required for floral induction in Impatiens balsamina	1113
Short communication	
Greksak, M., T. Asahi and I. Uritani: Increase in mitochondrial activity in diseased sweet potato root tissue	1117
Roy, B. N., R. N. Basu and T. K. Bose: Interaction of auxins with growth-retarding, -inhibiting and ethylene-producing chemicals in rooting of cuttings	1123
Sakai, A. and K. Ōtsuka: A method for maintaining the viability	1129
Mitchell, E. K. and P. J. Davies: Indoleacetic acid synthesis in sterile roots of <i>Phaseolus coccineus</i> Iwanami, Y.: Retaining the viability of <i>Camellia japonica</i> pollen in	135